

# Prestressing by Stripwinding

Prestressing is widely used in industry to bring technical parts into a compressive stress state and that way increase their loadability and lifetime. Dies for high-pressure applications such as cold forging, powder compaction, or high-pressure synthesis/sintering of industrial diamonds or CBN particularly benefit from prestressing. Without sufficient prestressing, these tools would plastify or crack prematurely. More details about the basics of prestressing can be found in the corresponding tech note [here](#).

## Stripwinding concept

Prestressing by stripwinding is carried out by winding many layers of steel strip around a winding core. Stripwound containers can be thought of as reinforcement systems with an infinite number of rings, where each winding adds to the strength of the container. Originally, stripwinding was applied to create a safe reinforcement system, as only the inner layers of a stripwound container would crack in case of overloading. Today the superior strength of stripwound reinforcement systems is considered their main advantage. The practical use of stripwinding for creating high-strength containers is described in more detail in the tech note "[The STRECON container concept](#)".

## Strip material

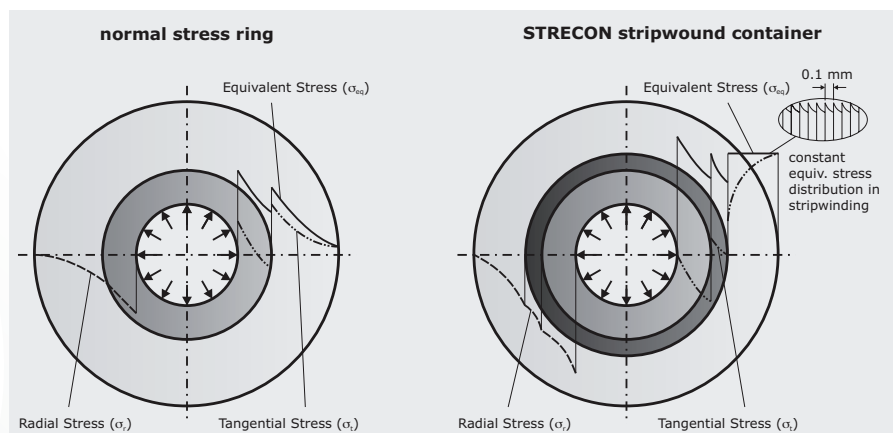
The material used for stripwinding is 0.1 mm thick. It is fully elastic up to 2000 MPa and therefore 1.5 times stronger than typical reinforcement materials. Depending on the temperature of the application, STRECON uses two different material grades. Strip200 is used for applications where the reinforcement temperature does not exceed 200°C, and Strip400 is designed for use up to 400°C. In case the maximum temperature is exceeded, plastic deformation of the strip material may occur, resulting in a loss of reinforcement strength.

## Winding process

A special winding machine controls the stress for each layer of strip material. This way, a constant stress distribution under load is achieved in the strip material, making stripwound containers the strongest available prestressing system in the industry. The stripwinding takes place around a core made of hardened tool steel or cemented carbide, which is thereby prestressed to -2000 MPa or -2500 MPa, respectively.



The stripwinding process of small containers



Comparison of the equivalent stresses of a normal compression ring with the prestressing tool system made by stripwinding. The reinforcement strength is increased by each layer of strip material.